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Japanese Patent

Hei 11-39053

SMALL-SCALE ELECTRONIC EQUIPMENT

[Kogata Denshi Kiki]

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Specification

1. Title of the invention

SMALL-SCALE ELECTRONIC EQUIPMENT

2. Claims

/2

1. A small-scale electronic equipment, characterized by being equipped with an infrared ray reception means that receives infrared rays being transmitted from a prescribed transmission source; a lock means that holds a lid part arranged in a freely opening and closing way in a main body part, in which a circuit device is housed, in a closed state when the infrared rays being transmitted from the above-mentioned prescribed transmission source by the infrared ray reception means are not received; and a lock release means that releases the lock of the lock means and can open and close the above-mentioned lid part when a password being input from the outside is matched with a preset value.

2. A small-scale electronic equipment, characterized by being equipped with an infrared ray reception means that

¹ Numbers in the margin indicate pagination in the foreign text.

receives infrared rays being transmitted from a prescribed transmission source; an antitheft mode setup means that sets an antitheft mode for preventing the theft of a device; a lock means that holds a lid part arranged in a freely opening and closing way in a main body part, in which the circuit device is housed, in a closed state when the infrared rays being transmitted from the above-mentioned prescribed transmission source by the infrared ray reception means are not received in a state in which the antitheft mode setup means is set to the antitheft mode; and a lock release means that releases the lock of the lock means and can open and close the above-mentioned lid part when a password being input from the outside is matched with a preset value.

3. The small-scale electronic equipment of Claim 1 or 2, characterized by the fact that the password being input from the above-mentioned outside is input from a portable remote controller by the infrared rays.

4. The small-scale electronic equipment of Claim 1 or 2, characterized by the fact that the main body part in which the circuit device is housed consists of a case made of a metal having an opening part opened in only one direction; and the above-mentioned lid part consists of a display with a structure in which the opening part is opened and closed.

3. Detailed explanation of the invention

[0001]

(Technical field of the invention)

The present invention pertains to a portable small-scale electronic equipment such as portable computer and small-scale information terminal. Specifically, the present invention pertains to a small-scale electronic equipment equipped with an infrared device for communication.

[0002]

(Prior art)

Along with the advance of high performances of computers, many small-scale electronic equipments such as portable computers and electronic notebooks using a liquid crystal display also appear. In particular, portable computers are not only simply portable and convenient, but the area of a desk can be efficiently used, compared with the case where a deep large-scale CRT display or a case for a desktop type large-scale computer body is used. For this reason, they have recently been used instead of desktop computers in offices and homes.

[0003] On the other hand, these portable small-scale electronic equipments have essentially portable weight and size, regardless of whether or not an owner has an intention of always putting

them on a desk. Therefore, for example, if a user returns to home while leaving it on the desk of an office, a third party is likely to carry it out without a permission. In order to prevent the theft of information stored in a small-scale electronic equipment by preventing this accident represented by the theft, a method that installing these small-scale electronic equipment with chains on a pillar or desk when users return to home and a method that put it in a desk and locks it have been adopted. However, in these conventional measures, the mounting and removal of the chains was complicated, and if there was no space that could house a small-scale electronic equipment in a drawer of the desk, it could not be housed. Also, the chains were simply cut out unless considerably strong chains were attached, and in case strong chains were attached, there was no space and strength for mounting the chains at the portable computer side.

[0004] Accordingly, in Japanese Kokai Patent Application No. Hei 5[1993]-35355, a technique that mounts two kinds of sensors of a P sensor for detecting the installation pressure of a portable computer and a C sensor for detecting an inclination in the portable computer is presented. In this technique, using the detection output of these two sensors, the installation situation of the computer body is monitored, and when the change

is detected, the power is cut off. Also, at that time, a key is locked in terms of hardware, so that the main body cannot be used further, thereby protecting the internal information.

[0005] Figure 11 shows a control flow for protecting the portable computer of Japanese Kokai Patent Application No. Hei 5[1993]-35355. After a monitoring system of the portable computer is connected (step S101), if carrying-out of the portable computer of an improper person is detected (step S102), the monitoring system is cut off (step S103), and a buzzer emits a sound (step S104). Then, the system of the portable computer is cut off (step S105), so that the use of the computer is impossible. Thereby, the internal information can be protected (step S106).

[0006] Also, in Japanese Kokai Patent Application No. Sho 62[1987]-290997, signal waves such as radio waves, infrared rays, laser, and ultrasonic waves are continuously emitted from a device that is carried with the human body, and a reception part and a sound emitting circuit are arranged in one's possessions such as handbag arranged in the range where these signals waves can be received. Thus, if these possessions are left and forgotten or stolen, the sound emitting circuit emits a sound and gives an alarm.

[0007] Furthermore, in Japanese Kokai Patent Application No. Hei 5[1993]-176374, a personal computer monitor is in a state in which it can exchange radio waves with each personal computer,/3 and when each personal computer is started, user ID, password, and installation side of personal computer, etc., are transmitted. The personal computer monitor checks the received signals and transmits a usage permit signal in a usage permitted state to the personal computers. Also, in a personal computer that is improperly from other places, since its use is not permitted and the power of the personal computer is held in an off state, the contents of files can be protected.

[0008]

(Problems to be solved by the invention)

Among them, in the technique presented in Japanese Kokai Patent Application No. Hei 5[1993]-35355, if there is no person around after all the members of an office return to their home or if a speaker is blocked or a portable computer is put into a container such as bag with excellent soundproof effect, it can be simply carried, so that the security is insufficient. Also, even if the power is cut off and the portable computer is forcedly set to an inoperable state, the portable computer can be easily decomposed after stealing. Therefore, if a memory medium such as hard disk is pulled out of the main body,

important data stored in it can be read out, so that the safety of the security cannot be completely realized. Furthermore, since many of these components can be shared with the computer, there is also a possibility that expensive parts are used by others and sold.

[0009] Also, in Japanese Kokai Patent Application No. Sho 62[1987]-290997, since an owner himself is separated far from his possessions such as portable computer by returning to his home, etc., it is necessary to emit an alarm at that time. In other words, this proposal is applied to the case where the owner carries the portable computer as a body, it cannot be applied to the case where the portable computer is left in an office. Needless to say, if a device that is carried with the human body remains near the possessions such as portable computer, an accident of picking up only the possessions can be monitored, however if they are picked up together, no alarm is emitted.

[0010] Furthermore, in the technique presented in Japanese Kokai Patent Application No. Hei 5[1993]-176374, if a stolen product is carried in office, etc., where a personal computer monitor is used, the use of the personal computer is prohibited or can be discriminated as a stolen product. However, in this case, such a case should be a rare case, and the personal computer can be

used without trouble in home or other places. Also, since measures for preventing the theft itself are not taken, the personal computer itself is freely carried away.

[0011] Accordingly, the purpose of the present invention is provide a small-scale electronic equipment that can prevent a small-scale electronic equipment from being stolen, even if it is left on desk, etc., and can effectively prevent the leakage of information, even if the small-scale electronic equipment is carried in.

[0012]

(Means to solve the problems)

The invention of Claim 1 is a small-scale electronic equipment equipped with (i) an infrared ray reception means that receives infrared rays being transmitted from a prescribed transmission source, (ii) a lock means that holds a lid part arranged in a freely opening and closing way in a main body part, in which a circuit device is housed, in a closed state when the infrared rays being transmitted from the above-mentioned prescribed transmission source by the infrared ray reception means are not received, and (iii) a lock release means that releases the lock of the lock means and can open and close the above-mentioned lid part when a password being input from the outside is matched with a preset value.

[0013] In other words, in the invention of Claim 1, when the infrared rays being transmitted from the above-mentioned prescribed transmission source are not received by the infrared ray reception means, the lid part arranged in a freely opening and closing way in the main body part in which the circuit device is housed is held in a closed state, and the lid part cannot be opened unless the lock is released by using a password, so that the small-scale electronic equipment cannot be disassembled by a third party.

[0014] The invention of Claim 2 is equipped with (i) an infrared ray reception means that receives infrared rays being transmitted from a prescribed transmission source, (ii) an antitheft mode setup means that sets an antitheft mode for preventing the theft of a device, (iii) a lock means that holds a lid part arranged in a freely opening and closing way in a main body part, in which the circuit device is housed, in a closed state when the infrared rays being transmitted from the above-mentioned prescribed transmission source by the infrared ray reception means are not received in a state in which the antitheft mode setup means is set to the antitheft mode, and (iv) a lock release means that releases the lock of the lock means and can open and close the above-mentioned lid part when a

password being input from the outside is matched with a preset value.

[0015] In other words, in the invention of Claim 2, when the infrared rays being transmitted from the above-mentioned prescribed transmission source are not received by the infrared ray reception means in a state in which the small-scale electronic equipment is set to an antitheft mode, the lid part arranged in a freely opening and closing way in the main body part in which the circuit device is housed is held in a closed state, and the lid part cannot be opened unless the lock is released by using a password, so that the small-scale electronic equipment can be disassembled by a third party. Thus, the function for the antitheft of the small-scale electronic equipment can be turned on and off by the existence of the setup of the antitheft mode.

[0016] The invention of Claim 3 is characterized by the fact that in the invention of Claim 1 or 2, the password being input from the above-mentioned outside is input from a portable remote controller by the infrared rays. If this portable remote controller is possessed, the small-scale electronic equipment can be carried out to the outside, so that inconveniences such as theft of information can be avoided, even if the equipment is left and forgotten at outgoing destination, etc.

[0017] The invention of Claim 4 is characterized by the fact that in the invention of Claim 1 or 2, the main body part in which the circuit device is housed consists of a case made of a metal having an opening part opened in only one direction; and the above-mentioned lid part consists of a display with a /4 structure in which the opening part is opened and closed. Thus, if the lid part is locked and is not opened, since the circuit device cannot be removed from the main body part, the leakage of information can be prevented.

[0018]

(Embodiment of the invention)

[0019]

(Application example)

Next, the present invention is explained in detail by an application example.

[0020] Figure 1 shows an outline of the circuit constitution of a portable computer as the small-scale electronic equipment in an application example of the present invention. The portable computer 10 is equipped with a computer body 11 and a lid part 13 that is arranged in a freely opening and closing way by a hinge mechanism 12 with respect to the computer body 11. In the lid part 13, a liquid crystal display (LCD) 14 is assembled into the side opposite to the computer body 11.

[0021] The computer body 11 consists of a D-D (digital-digital) converter 21 that inputs a direct-current power and converts it into a desired voltage, a power supply circuit 22 for supplying the direct-current voltage obtained from the D-D converter 21 to each circuit in the computer body 11, a battery 23 for supplying a power of a built-in power source, a pair of lock mechanisms 24 and 25 for locking the operation of the liquid crystal display 14 in a prescribed case, a LCD lock control device 27 for controlling these lock mechanisms 24 and 25, and a body side infrared function part 28 that is connected to the LC lock control circuit 27 and carries out an infrared communication. Also, an AC (alternating current) adapter 31 for supplying a direct-current power to the D-D converter 21 and connected to a commercial power source 32. Also, in the portable computer 10, an external infrared function part 33 and an infrared communication remote controller (remote controller) 34 are prepared as attached equipments, and the external infrared function part 33 is connected to the commercial power source 32 to supply a power.

[0022] The battery 23 supplies a power to a memory, which will be explained, in the portable computer 10 in a state in which the AC adapter 31 is not connected to the commercial power 32 and holds information, and in a state in which the portable

computer 10 is set to an antitheft mode, the control for preventing a theft is realized by supplying a power to the body side infrared function part 28. Also, if the power is turned off in a state in which the portable computer 10 is set to the antitheft mode, the LCD lock control circuit 27 is operated, and when the lid part 13 is closed, this state is held.

[0023] Figure 2 shows the appearance of the portable computer of this application example. First and second hooks 41 and 42 are mounted at both corner parts of the upper part in the figure of the lid part 13 of the portable computer 10, and first and second latch holes 43 and 44 for latching them at the corresponding positions of the computer body 11. Also, a lock lever 46 for releasing the lock of the portable computer 11 and an insertion hole 53 for inserting a metal fitting 52 of the tip of a chain 51 into the portable computer 10 are bored in a right surface 45 of the computer body 11. Furthermore, a window 56 for infrared transmission and reception of the body side infrared function part 28 is arranged on a front 55 of the computer body 11. The lock lever 46 is also similarly arranged on the left surface of the computer body 11, though it is shown in the figure.

[0024] Figure 3 shows a part arrangement of data in a state in which the portable computer is disassembled. The portable

computer 10 freely opens and closes the lid part 13 with respect to the computer body 11 by the above-mentioned hinge mechanism 12. The hinge mechanism 12 consists of a pair of tubular metal fittings 12A arranged at the computer body 11 and pins 12B that are installed at the lid part 13 and idly inserted into the tubular metal fittings 12A. In the hinge mechanism 12 whose assembly has been finished, the opening part of its front is covered with a protective lid 57 so that the hinge mechanism 12 itself may not be broken down in a state in which the lid part 13 is closed.

[0025] In the computer body 11, circuit parts such as battery 23, hard disk 62, body side infrared function part 28, and memory device 63 are mounted on the bottom face in a box type case 61 formed of a light metal such as titanium. At the upper part of the case 61, a keyboard part 64 is fixed to the case 61 by a screw 65. At the side wall of the case 61, holes 43 and 44 for latch that have a thickness to some degree and insert the corresponding first or second hook 41 and 42 into the position right on the lock lever 46 are bored.

[0026] In a state in which the portable computer 10 of this application example is set to the antitheft mode, if the lid part 13 is closed, the lock lever 46 inserted into a hole 67 for latch is latched to a latch metal fitting, which will be

mentioned later, and locked. Also, the case 61 is an integrated type and does not have a structure in which the bottom plate is fixed with a screw. Therefore, the portable computer 10 cannot be disassembled from the bottom side of the computer body 11, and the screw 65 cannot be removed unless the lid part 13 is opened in a lock state of the portable computer 10. In other words, internal parts such as hard disk 62 cannot be drawn out by removing the keyboard part 64.

[0027] Figure 4 shows a state in which the lid part of the portable computer is closed. As mentioned above, if the lid part 13 is closed, the front of the protective lid 57 at the computer body 11 is covered with the lid part 13. Therefore, in a state in which the portable computer 10 is locked at the antitheft mode, the computer body 11 and the lid part 13 /5 cannot be separated by removing the protective lid 57, and the inside of the portable computer 10 cannot be disassembled by a method for separating both of them.

[0028] Figure 5 shows a state in which the mechanism part of the lock mechanism is released, and Figure 6 shows a state in which the lock mechanism is operated and set to a lock state. In the lock lever 46, a connecting metal fitting 72 protruded to the inside of the computer body 11 from its bottom face is connected to the second latch hole 44 shown in Figure 5 or 6 in a shape in

which it is idly inserted into a long hole 75. Therefore, if the lock lever 46 made of a metal is moved in an arrow 71 direction, a latch metal fitting 73 is also moved in a body with it inside the second latch hole 44. Also, Figures 5 and 6 show the right surface 45 of the portable computer 10. On the left surface, the first latch metal fitting 43 (see Figure 3) is latched with the first hook 41, however since this relation is the same as that of the second hook 42, its explanation is omitted.

[0029] The upper part of the latch metal fitting 73 constitutes a key part 73A that is bent at a right angle to latch the second hook 42 partially buried in the lid part. Therefore, as shown in Figure 5, if the lock lever 46 is moved to a limit position in the separating direction (the right direction in the figure) from the second hook 42 in the second latch hole 44 against the force of a spring which is not shown in the figure, the second hook 42 is inserted into the second latch hole 44, and as shown in Figure 3, the lid part 13 can be completely closed. In this state, if an operator separates his hand from the lock lever 46, the tip of the second hook 42 is fitted to the concave part of the key part 73A. Thus, the lid part 13 of the portable computer 10 is locked.

[0030] However, in state in which the portable computer 10 is set to the antitheft mode, the operator can freely move the lock lever 46 in the arrow 71 direction. In other words, since the latch state to the latch metal fitting 73 of the second hook 42 can be released at any time, so that the lid part 13 can be opened as shown in Figure 2. If the antitheft mode is set, as will be mentioned next, the lock lever 46 cannot be moved in the arrow 71 direction, and it is necessary to meet the following two conditions to release this lock state.

[0031] (1) An environment in which the external infrared function part 33 shown in Figure 1 can be communicated. In other words, like the case where the portable computer of this application example is picked up from a desk, if the body side infrared function part 28 cannot communicate with the external infrared function part 33, this lock state cannot be released.

[0032] (2) A preset password is input into the portable computer 10 from the infrared communication remote controller 34 shown in Figure 1. In other words, even if the lock lever 46 is operated in the place where the portable computer 10 is installed, the lock state cannot be released unless the password is input from the infrared communication controller 34 and matched.

[0033] The release of this lock state is controlled by the LCD lock control circuit 27 shown in Figure 1. Then, in a state in

which the above-mentioned conditions are not met and the lock release is not permitted, a pair of lock mechanisms 24 and 25 shown in Figure 1 electrically hinder the movement of the latch metal fitting 73. This structure can exist variously.

[0034] For example, the lock mechanisms 24 and 25 are equipped with solenoids, and a plunger not shown in the figure is advanced and retreated in accordance with ON and OFF of the power. In the latch metal fitting 73 shown in Figures 5 and 6, a hole for inserting the tip part of the plunger is opened, and the tip part of the plunger and the hole are set to the positions where the directions are matched in the lock state shown in Figure 6. Therefore, in a state in which the portable computer 10 is set to the antitheft mode, if the tip part of the plunger is inserted into the hole, the lock state can be continued by hindering the movement of the latch metal fitting 73.

[0035] Figure 7 shows the main parts of the circuit constitution of the portable computer of this application example. The portable computer 10 is equipped with a CPU (central processing unit) 81 for various kinds of controls. The CPU 81 is connected to each part in the device via a bus 82 such as data bus. Among them, a ROM 63A is a read-only memory housed to control each part of the portable computer 10. Also, a RAM 63B is a work

memory for temporarily storing various kinds of data and is constituted by a random access memory. The keyboard part 64 is connected to the bus 82 via an input circuit 83 and inputs various kinds of data by a key. The hard disk 62 is connected to the bus 82 via a disk control circuit 85 such as Sukaji[transliteration] card and stores data such as prepared documents and programs for various kinds of controls. The body side infrared function part 28 and the lock mechanisms 24 and 25 are also connected to the bus 82.

[0036] Figure 8 shows the control at a time of an initial power input after the portable computer is purchased. Also, this control and other controls, which will be mentioned later, related to the computer body 11 are realized by implementing the programs stored in the ROM 63A shown in Figure 7 or the hard disk.

[0037] First, if the power of the portable computer 10 is initial input (step S201: Y), a setup request of its password is displayed on the liquid crystal display 14 shown in Figure 1 (step S202). Also, when the portable computer 10 is purchased, since the lock mechanism which will be mentioned in detail /6 later is not operated, the operator can operate the key by opening the lid part 13. If the operator inputs the password (step S203: Y), the CPU 81 displays the setup request showing

whether the antitheft mode is set to ON or OFF. If the operator sets to one of them (step S205: Y), the CPU 81 waits for the time when the power of the portable computer 10 is turned off in terms of software (step S206). Then, when the power is turned off (step S206: Y), the ON/OFF information of the antitheft mode stored in a nonvolatile memory area of the RAM 63B is read out. As a result, if the antitheft mode is set (step S207: Y), the lock mechanism is operated. In other words, the state in which the lid part 13 is closed is locked. If the antitheft mode is not set (step S207: N), the lock mechanism is not operated, and the processing is finished (end).

[0038] Figure 9 shows a work flow for temporarily releasing the lock at the antitheft mode in which the lock mechanism is operated. As already been explained, in a state in which the lock mechanism is operated, the lid part 13 remains in a closed state. In order to release this state, it is necessary to transmit the password to the portable computer 10 from the infrared communication remote controller 34 shown in Figure 1. If the password is transmitted, the body side infrared function part 28 receives it (step S301). The CPU 81 compares the received password with the password stored and registered in the nonvolatile memory area of the RAM 63B (step S302). Then, if both of them are matched (step S303: Y), the lock mechanism is

released, assuming that the owner of the portable computer 10 has operated the release (step S304). On the contrary, if the password transmitted is wrong (step S303: N), the lock mechanism is not released.

[0039] Figure 10 shows a control state of the case where the portable computer is carried away. The portable computer 10 of this application example cannot be carried away from desk, etc., without a permission by inserting the metal fitting 52 of the tip of the chain 51 into the insertion hole 53 of the portable computer 10 as shown in Figure 2. However, in spite of that, if there is a person who tries to carry away the portable computer 10, its use or the disassembly of the portable computer 10 can be prevented.

[0040] In other words, at the antitheft mode, the CPU 81 monitors whether or not the infrared rays including a prescribed ID information are always transmitted to the body side infrared function part 28 from the external infrared function part 33 shown in Figure 1 (step S401). The reason for the check of the identity of the ID information is that the person who has carried away the portable computer 10 cannot be avoided from the detection of the carrying-away by receiving the infrared rays from the external infrared function part 33. However, the check

about whether the infrared rays are received is sufficient in accordance with the check system for the antitheft.

[0041] If the infrared rays are not received by the infrared function part 28 or if the ID information is different even if the infrared rays are received, the CPU 81 discriminates whether or not the power of the portable computer 10 is turned off in terms of software (step S402). In a state in which the power is turned off (Y), an alarm sound is emitted from a buzzer (step S403), the lock mechanism is operated (step S404), and the lid part 13 of the portable computer 10 cannot be opened.

[0042] In a state in which the power is not turned off (step S402: Y), a warning display for instructing the return of the portable computer 10 to the original place is carried out at that time (step S405). The warning may be displayed by showing a phase or figure on the liquid crystal display 14, or the buzzer may be sounded, or a voice for warning may be output. In case the original owner of the portable computer 10 moves it to another place for a certain reason, the warning is not displayed if it is returned to the original position before a prescribed time t is lapsed (step S406: N).

[0043] On the contrary, even after the prescribed time is lapsed, if the portable compute 10 is not returned to the original position, there is a possibility of a theft.

Accordingly, whether or not the same ID information is further received is checked when the time t is lapsed (step S407). If the same ID information is used (Y), the portable computer 10 is arranged at the position where it should usually be arranged. Therefore, since the theft is not caused in this case, the lock mechanism is not operated, and the processing is finished (end).

[0044] On the contrary, when the time t is lapsed, if the infrared rays are not detected or the ID information is not the same even if the infrared rays are detected (step S407: N), the power of the portable computer 10 is cut off in terms of software (step S408). Then, the state in which the lid part 13 of the portable computer 10 is closed is locked (step S404), and the computer body 11 cannot be disassembled.

[0045] Also, in a state in which the portable computer 10 of this application example is operated, the release of the antitheft mode is set as the condition in which the password is matched. Therefore, if the portable computer 10 is carried to an outgoing destination, the monitoring of carrying-out through the infrared communication with the external infrared function/7 part 33 can be released by releasing the antitheft mode. Thus, in case the portable computer 10 is carried, the computer can be started even during the setup of the antitheft mode by carrying the infrared communication remote controller 34.

[0046] Also, in case the portable computer 10 is carried in this case, when the power is simply turned off instead of the control explained in Figure 10, the mode can also be transited to a mode for operating the lock mechanism. If such a special mode is set, when the portable computer 10 is left and forgotten, a third party cannot open its lid part 13, so that the security can be secured.

[0047]

(Effects of the invention)

As explained above, according to the invention of Claim 1, when the infrared rays being transmitted from the above-mentioned prescribed transmission source are not received by the infrared ray reception means, the lid part arranged in a freely opening and closing way in the main body part in which the circuit device is housed is held in a closed state. Thus, the antitheft effect can be simply raised using the infrared communication means provided to many small-scale electronic equipments. Furthermore, since the lid part cannot be opened unless the lock is released by using a password, the small-scale electronic equipment can be prevented from being accessed or carried out by a third party.

[0048] Also, according to the invention of Claim 2, since ON and OFF of the antitheft mode can be controlled, in case the small-

scale electronic equipment is shared in an environment in which the theft is difficult to be caused, a special sequence is not required to open the lid part of the small-scale electronic equipment, and the functions of the equipment can be divided and used in accordance with the environments.

[0049] Furthermore, according to the invention of Claim 3, if this portable remote controller is possessed, the small-scale electronic equipment can be carried out to the outside, so that inconveniences such as theft of information can be avoided, even if the equipment is left and forgotten at outgoing destination, etc.

4. Brief description of the figures

Figure 1 is a block diagram showing the outline of the circuit constitution of the portable computer in an application example of the present invention.

Figure 2 is an oblique view showing a state in which a lid part of the portable computer as the small-scale electronic equipment of an application example of the present invention is opened.

Figure 3 is an oblique view showing a part arrangement in a state in which the portable computer of this application example is disassembled.

Figure 4 is an oblique view showing a state in which the lid part of the portable computer of this application is closed.

Figure 5 is an oblique view showing a state in which the mechanism part of a lock mechanism is released in this application example.

Figure 6 is an oblique view showing a state in which the lock is set by operating the lock mechanism.

Figure 7 is a block diagram showing the main parts of the circuit constitution of the portable computer of the application example.

Figure 8 is a flow chart showing the control at a time of an initial power input after the portable computer is purchased.

Figure 9 shows a work flow for temporarily releasing the lock at the antitheft mode in which the lock mechanism is operated.

Figure 10 is a flow chart showing a control state of the case where the portable computer is carried away.

Figure 11 is a flow chart showing the control flow for protecting a portable computer.

Explanation of numerals:

- 10 Portable computer (small-scale electronic equipment)
- 11 Computer body
- 23 Battery

24, 25 Lock mechanisms

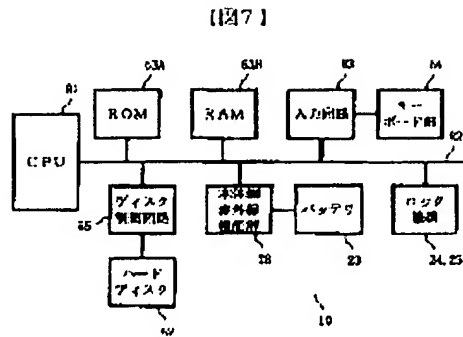
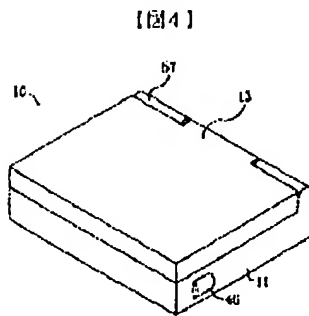
27 LCD lock control circuit

28 Body side infrared function part

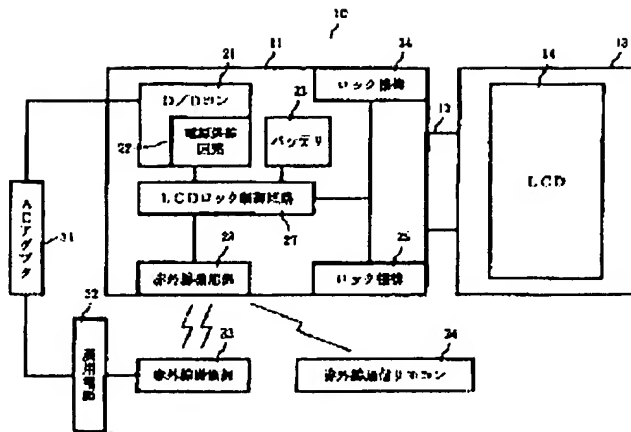
33 External infrared function part

41, 42 Hooks

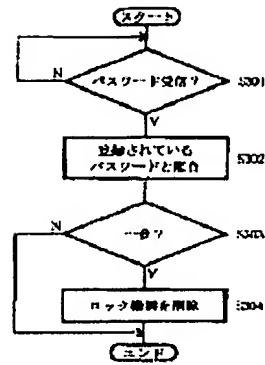
46 Lock lever



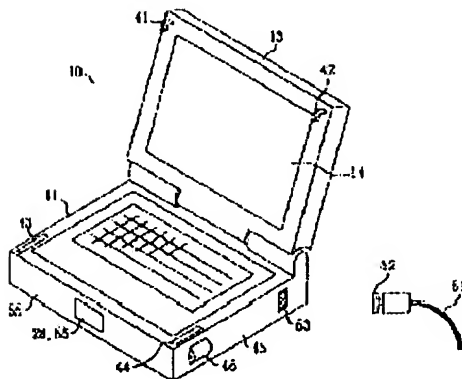
【図1】



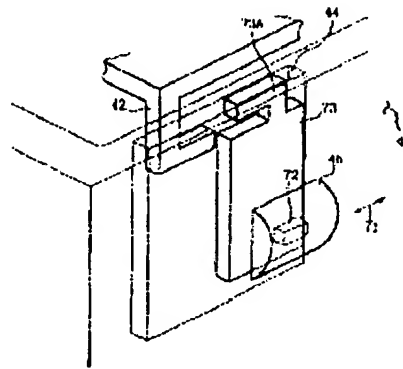
【図9】



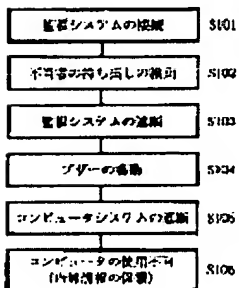
【図2】



【図5】



【図11】



- 28 Body side infrared function part
- 54 Keyboard part
- 82 Hard disk
- 83 Input circuit
- 85 Disk control circuit

Figure 1:

- 22 Power supply circuit
- 23 Battery
- 24 Lock mechanism
- 25 Lock mechanism
- 27 LCD lock control circuit
- 28 Infrared function part
- 31 AC adapter
- 32 Commercial power source
- 33 Infrared function part
- 34 Infrared communication remote controller

Figure 9

- 1. Start
- 2. End
- S301 Password reception?
- S302 Collation with the registered password

S303 Matched?

S304 Cancellation of lock mechanism

Figure 11:

S101 Connection of monitoring system

S102 Detection of carrying-out of an improper person

S103 Cut-off of monitoring system

S104 Sounding of buzzer

S105 Cut-off of computer system

S106 Unusable state of computer (protection of internal
information)

Figure 8:

1. Start

2. End

S201 Power ON?

S202 Password setup request

S203 Password input?

S204 Antitheft mode ON/OFF request

S205 Setup?

S206 Power OFF?

S207 Antitheft mode?

S208 Operation of lock mechanism

Figure 10:

1. Start
 2. End
- S401 Same infrared reception?
- S402 Power OFF?
- S403 Output of warning ON
- S405 Warning display showing the return to the original place
- S406 Time t lapsed?
- S407 Same infrared reception?
- S408 Power OFF
- S404 Operation of lock mechanism